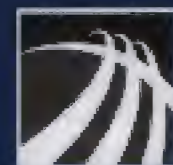
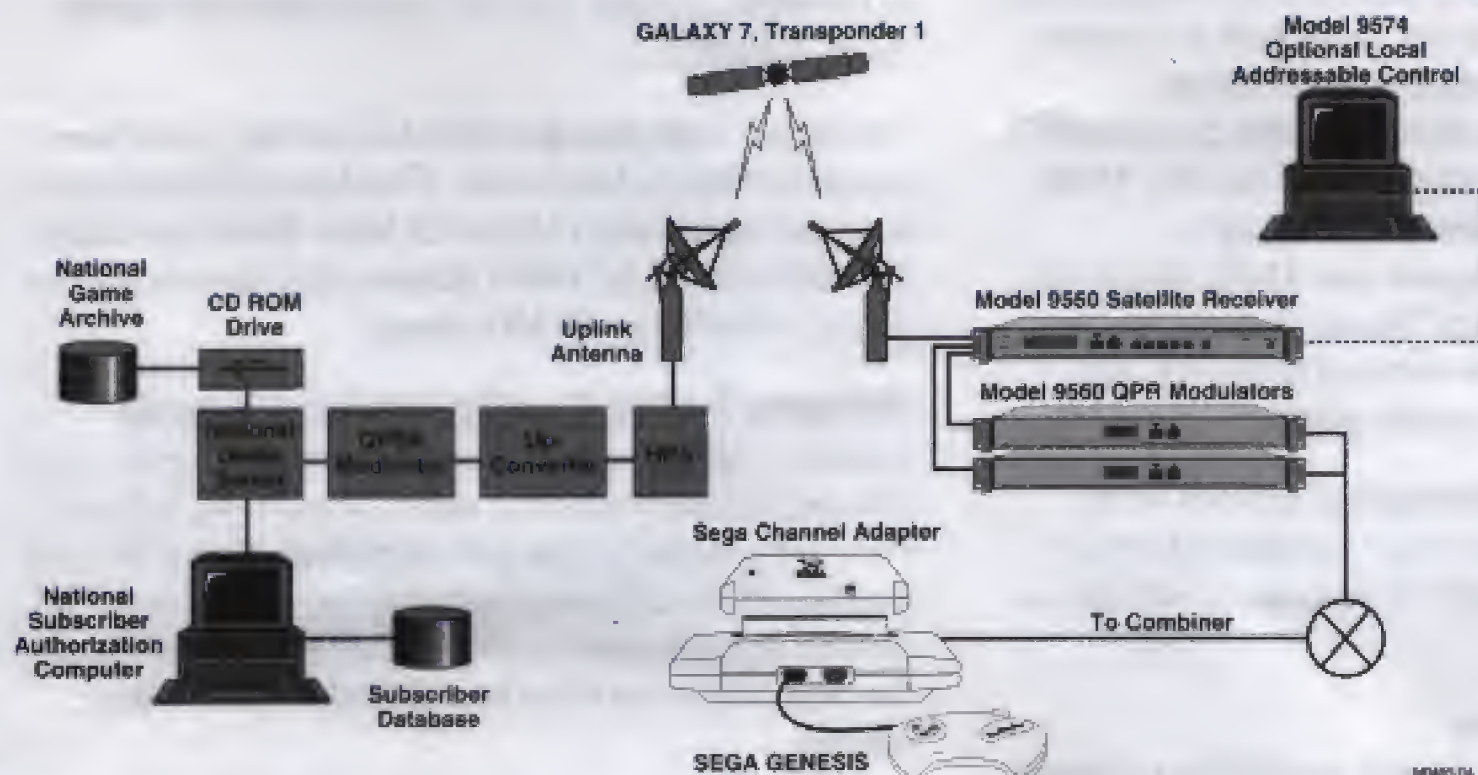


## Applications

### Sega Channel<sup>SM/TM</sup> Delivery System



Scientific  
Atlanta



Scientific-Atlanta's Sega Channel Delivery System delivers video games via satellite to your subscribers' homes. The system provides unmatched speed, quality and flexibility.

#### DESCRIPTION

##### **Large Selection of Games**

Each month, Sega Channel offers approximately 50 video games over satellite. These range from "classics" to "sports" games to "test drives" of games yet to be offered in the retail marketplace. Each 3 MHz carrier has the capacity to hold up to 30 games, and the game system is upgradeable to eight carriers. This will enable tiering of the service and expandable game capacity as new carriers are added.

##### **National vs. Local Addressability**

Although the Sega Channel signals are transmitted on a national basis,

your system has the option of selecting national or local addressable control.

Using national addressability, SEGA addressable transactions entered into the cable operator's billing system are transmitted to a computer located at the Sega Channel uplink facility. Addressable authorizations and de-

authorizations are transmitted with the game data over satellite to the cable operator's headend for distribution to adapters in subscribers' homes. With local addressability, the DCS Addressable Computer is located at the cable operator's office and addressable transactions are inserted on the game data signal for distribution to Sega Channel homes.

#### FEATURES

- Approximately 50 games per month
- National game origination
- National or local addressability options
- Fast data rate - 6 Mbps per carrier (12 Mbps total)
- Efficient bandwidth utilization
- Simple, consumer self-install
- Advanced security system
- Proven technology, available today



# Sega Channel Delivery System

Both systems are compatible with standard billing vendor interfaces. However, local control offers more control over time out, service levels, and play-per-day options.

## Game Delivery

The game delivery is the same for both types of addressability. The games originate at the Sega Channel uplink and are transmitted via satellite Galaxy 7, Transponder 1. The signals are transmitted to the receiving antenna and are passed through a low-noise device into the Model D9550 Satellite Receiver at the service provider's headend. The receiver processes the signal and provides two data carriers which are fed into two Model D9560 QPR Modulators. These frequency agile modulators then transmit signals onto 3 MHz bandwidth and are sent to the subscribers' homes. Two carriers are modulated at an operator-determined frequency and combined for carriage on the cable plant.

At the subscriber's home, the signal is received by the Sega Channel game adapter which is connected to the subscriber's SEGA GENESIS™ 16-bit Game Controller via the game cartridge slot.

## High Performance System

At 6 Mbps per carrier, the Scientific-Atlanta Sega Channel Delivery System is the fastest system on the market. This is important at both the headend and your subscriber's home. Because of this performance, a game can be downloaded from the headend to the adapter in less than one minute, even less if the game is repeated in the data stream. The menu and ticker that shows on the screen during download, are available in approximately six seconds.

The system is upgradeable to eight carriers. This is important as more games are added to the service. The Sega Channel Delivery System has a capacity of up to 240 games. This will enable tiering and expanding game capacity if new carriers are required as the service expands.

The Sega Channel signal operates in a typical cable plant environment. The minimum carrier-to-noise ratio is 22 dB and the input level range for the signal is +5 to -20 dBmV.

## Efficient Bandwidth Utilization

Each carrier of the Sega Channel Delivery System only takes up 3 MHz of bandwidth. These carriers can be placed in areas of the spectrum where analog video would not survive. For example, your system can place Sega Channel carriers in the "roll up" below channel 2, in the Guardband (72 to 76 MHz), in the FM gaps between 88 and 108 MHz, in the Aeronautical Channel range from 108 to 120 MHz, or in the "roll off" region above the highest video channel.

Two types of adapters are offered depending upon your system's available bandwidth. The Model D9593 Adapter has a tuning capacity of 50 to 120 MHz. Scientific-Atlanta also offers the Model D9591 Adapter that tunes to carriers placed in the 300 to 600 MHz range.

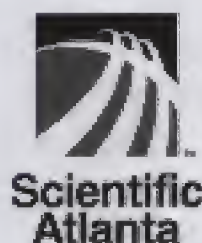
## Advanced System Security and Game Integrity

Scientific-Atlanta's advanced security system for the Sega Channel Delivery System is unparalleled in the industry. Prior to transmission, the game signals are scrambled and interleaved. In addition, a descrambling key, address and decoder are embedded in the ASIC chip. The game is in the clear only when it has been downloaded into the adapter.

While the game is downloading, several factors contribute to the signal's integrity. First, all errors are corrected during the download process and the game is completely downloaded before it begins. In addition, the downloaded game plays even if the cable plant goes down, since the game is downloaded into the adapter and the cable plant is no longer involved in the game-playing process.

The Sega Channel Delivery System is proven in both trials and actual launch performance with hundreds of thousands of units in the field. Our systems are generating revenue across the country today.

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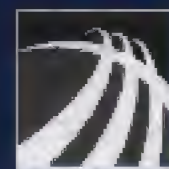
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## Applications

### Model D9550 QPSK Satellite Receiver



Scientific  
Atlanta



21948

Scientific-Atlanta's Model D9550 QPSK Satellite Receiver is an integral component in the reception and transmission of satellite game data as part of the Sega Channel<sup>SM/TM</sup> service.

### DESCRIPTION

The Model D9550 QPSK Receiver receives a 12 Mbps data signal from a 950 to 1450 MHz source. This signal is demodulated and transmitted to two Model D9560 QPR modulators.

The QPSK Receiver uses advanced technology, such as dual conversion topology, synthesized channel selection and automatic frequency control, to assure accurate reception and transmission of Sega Channel game data.

The front panel LCD display allows easy diagnostics and installation. And a microprocessor in the unit uses non-volatile memory to store front panel settings.

The 1.75-inch chassis ensures minimum impact on rack space. The QPSK Receiver is also ready to accommodate a conditional access insertion card, should local addressable control be desired.

### FEATURES

- Internal RF converter uses dual conversion topology
- Final intermediate frequency of 70 MHz
- Synthesized channel selection for improved channel tuning and user convenience
- Automatic Frequency Control (AFC) to compensate for LNB frequency drift
- Rear panel SMC bus for remote operation and monitoring
- Microprocessor retains stored front panel settings indefinitely in non-volatile memory
- Front panel LCD display shows input carrier power level,  $E_b/N_0$ , uncorrected bit error rate, AFC level, and other key operating parameters



# Model D9550 QPSK Satellite Receiver

## SPECIFICATIONS

### RF Input

Input impedance  
75  $\Omega$   
Input frequency  
950 to 1450 MHz  
Frequency step size  
1 MHz steps  
Input frequency tracking  
 $\pm 2.5$  MHz  
Input signal level range  
-28 to -68 dBm  
Forward error correction rate  
3/4 viterbi decoding  
Modulation  
QPSK

### Data Output

Channel symbol rate  
8 x 106 symbols/second  
Data output interface  
Output clock/data interface  
Differential clock and data; (2) RS-422  
Output data rate  
2 x 6 Mbps  
Output clock frequency  
12 MHz

### Environment

Operating temperature  
0°C to 50°C  
Storage temperature  
-25°C to +70°C  
Humidity  
90%, max. (non-condensing at 50°C)

### General

Operating voltage  
103.5 to 132 V AC, 60 Hz  
Power consumption  
40 W max. at 120 V AC  
Dimensions  
1.75 in. H x 19in. W x 18in. D  
Weight  
16 lbs

### Front Panel Indicators

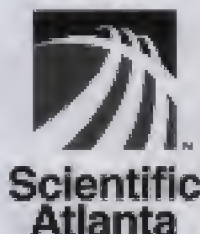
LCD display  
Data sync LED (green)  
Demod lock LED (green)  
Store LED (green)

### Rear Panel Connectors

Clock/data outputs  
2 female DB-9 connectors  
RF input  
950 to 1450 MHz, F-connector (can supply dc power to low-noise block converter)  
SMC bus  
IF Loop  
75  $\Omega$ , type F (input/output)  
IEC-compatible power socket  
Fuse

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## Applications

### Model D9560 QPR Modulator



Scientific  
Atlanta



21947

Scientific-Atlanta's Model D9560 QPR Modulator transmits a 6 Mbps data stream into 3 MHz of bandwidth. This signal can be placed between 50 and 600 MHz.

#### DESCRIPTION

The Model D9560 QPR Modulator is an integral component of the Sega Channel<sup>SM/™</sup> Data Delivery System. Each QPR Modulator processes an input data stream of 6 Mbps. The data stream is then modulated onto a 3 MHz band within the broadband spectrum of 50 to 600 MHz. The required frequencies for the Sega Channel Adapter are between 50 to 120 MHz or 300 to 600 MHz. In a typical headend application, two QPR Modulators are required to transport the game data with the total data rate of 12 Mbps. Additional carriers can be added, if required, to support larger game services.

#### ***Frequency Agile Provides Operational Flexibility***

The frequency agile output provides maximum flexibility for headend channel configurations. The microprocessor-controlled QPR Modulator allows 3 MHz bandwidth

of digital information to be located at frequencies from 50 to 600 MHz. This includes lower and upper "roll-off" regions, Guardband, FM band and Aeronautical Channels. Front panel push-button programming allows the operator easy access for changes in the output frequency plan.

#### FEATURES

- Up to 30 games per carrier
- Robust QPR modulation
- Frequency agile output of 50 to 600 MHz
- Data rate of 6 Mbps
- Adjustable RF output level
- Front panel digital display
- Non-volatile memory
- Remote serial interface
- Compact, 1.75-inch size



# Model D9560 QPR Modulator

## SPECIFICATIONS

### Data Input

Input data rate  
6 Mbps nominal  
Input clock frequency  
12 MHz  
Input clock/data interface  
RS-422 line receivers and drivers (balanced)

### Modulation Type

9-Quadrature partial response (9-QPR)

### Intermediate Frequency (IF)

IF output impedance  
75  $\Omega$   
IF output return loss  
16 dB, min.  
IF output level  
43,  $\pm$  1 dBmV  
IF output frequency  
44 MHz  $\pm$  1.3 kHz

### Modulated Output (RF)

Center frequency  
50 to 600 MHz  
Frequency steps  
250 kHz steps  
Channel output level  
40 to 50 dBmV, adjustable  
Spurious outputs to 870 MHz  
-50 dBc relative to channel output level  
RF output impedance  
75  $\Omega$   
RF output return loss  
15 dB, min.  
RF output test point  
-20 dB,  $\pm$  2 dBc relative to channel output level

### Environment

Operating temperature  
0°C to 50°C  
Storage temperature  
-40°C to +70°C  
Humidity  
85%, max.

### General

Operating voltage  
103.5 to 132 V AC, 60 Hz  
Power consumption  
45 W max. at 120 V AC  
Dimensions  
1.75 in. H x 19 in. W x 12 in. D  
Weight  
11 lbs

### Front Panel Indicators

Power LED (green)  
No clock input LED (red)  
No data input LED (red)  
Channel display (3-digit, 7-segment LED)  
Up/down buttons  
RF output level control  
RF test point (F)

### Rear Panel Connectors

Data/clock input  
Male DB-9 connector  
Data/clock output  
Female DB-9 connector  
RF output  
75  $\Omega$ , type F  
IF loop  
SMC bus  
Test/GND terminal (barrier strip)  
Fuse line card

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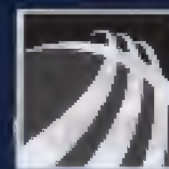
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## Applications

### Sega Channel<sup>SM/TM</sup> Digital Control System



Scientific  
Atlanta



22115

Scientific Atlanta's Digital Control System (DCS) provides local addressable control for systems launching Sega Channel. The DCS is primarily responsible for the control of the Sega Channel Adapters and subscriber management functions, but can also be linked to a host billing computer.

## BILLING

### **Local Addressability**

Scientific-Atlanta's Digital Control System (DCS), QPSK Satellite Receiver and two QPR Modulators allow operators to provide Sega Channel with local addressable control of adapters and features. When the cable headend receives an order for the Sega Channel, the addressable information is entered into the billing computer. The billing computer sends the addressable information into the DCS which combines the local addressable information with the games signal

in the QPSK Satellite Receiver. This signal is then modulated by two QPR Modulators and transmitted along existing cable plant to the subscriber's adapter in the home. Local control offers more system level control over time out and "Express Games" options.

With local control, the time out function can be set from one to 127 days.

## FEATURES

- High speed 486SL2 platform
- User friendly menu system
- Supports up to 8 Sega Channel and/or 8 DMX headends
- Host billing interface
- "Pass through" port for Scientific-Atlanta system manager
- User control of refresh, timeout, and "Express Games"
- Supports legal terminal test
- Supports addressable reset and parental password reset



# Sega Channel Digital Control System

## SPECIFICATIONS

### Hardware Platform

IBM PS/2 Model 9557 486SL2

66 MHz 486 processor

I/O Ports

4-port or 16-port DigiBoard™

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Digiboard is a trademark of DigiBoard, Inc.



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## Applications

### Scientific-Atlanta's Sega Channel<sup>SM/TM</sup> File Server Computer



Scientific  
Atlanta



22116

The Scientific-Atlanta File Server Computer is used to deliver the Sega Channel game data in areas where a satellite signal is not available.

#### DESCRIPTION

The File Server Computer allows delivery of more than 50 video games per month to subscribers' homes using a continuous data stream transmitted from CD-ROM source material.

Each month, the Sega Channel creates a CD-ROM disk which contains digital game information. This game data is forwarded to licensed Sega Channel affiliates. The File Server Computer formats the data from the CD-ROM, then scrambles and transfers the data to two Quadrature Partial Response (QPR) Modulators. The modulators then transmit the signal along existing cable plant to your subscribers' homes.

#### APPLICATIONS

The File Server Computer is available for use in areas outside of the continental United States where the Sega Channel satellite signal is not available. Or, with Sega Channel approval, the File Server Computer can be purchased for marketing demonstration of the Sega Channel at locations where no cable drop is available.

When used as a central transmitting device at a cable headend, the File Server allows the insertion of local addressable control information from a Model 9574 Digital Control System (DCS). This control data determines the operational status of the adapters.

#### FEATURES

- High speed Pentium platform
- SCSI I/O BUS
- Contains Scientific-Atlanta Model 9572 Data Delivery Board (DDB)
- Supports local addressable control interface
- Reads compressed, unencrypted, multiplexed data from CD-ROM to hard drive
- Hard Drive transmits continuous cyclical data stream
- DDB adds encryption, addressable control data, and forward error correction to game data stream



# Scientific-Atlanta's Sega Channel File Server Computer

## SPECIFICATIONS

### Hardware Platform

#### IBM Server 320 Model 8640-0YT

- Pentium 90 MHz processor
- 1.12 GB hard drive
- 3.5 in. floppy drive
- Fast SCSI double speed CD-ROM
- IBM PC-DOS
- MS-DOS 6.22

#### Scientific-Atlanta Model D9575 Data Delivery Board

##### Data Outputs

- Addressable interface port serial, up to 19.2 K baud
- (2) 6 Mbps serial data streams

##### Connections

- DB9, male
- (2) DB9, female

## ORDERING INFORMATION

Part #539041 Model #D9571

**Note:** This equipment requires CD-ROM Software that must be supplied by Sega Channel. Contact Sega Channel for further information on the availability of this product.

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Equipment specifications subject to change without notice.



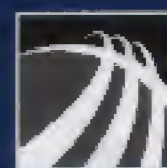
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## Applications

### Sega Channel<sup>SM/TM</sup> Game Adapter



Scientific  
Atlanta



21946

Scientific-Atlanta's Sega Channel game adapter downloads and stores the video game data, providing subscribers with uninterrupted play of Sega Channel games.

#### **DESCRIPTION**

Scientific-Atlanta's Sega Channel game adapter receives and downloads the Sega Channel service data signal. The adapter connects directly to the SEGA GENESIS<sup>TM</sup> unit through the existing cartridge slot. Once downloaded, the game is stored in the adapter providing repeated and uninterrupted play. The game remains stored in the adapter and can be replayed until it is reset or turned off. The adapter requires its own power and coaxial connection.

#### **User Friendliness**

Your subscribers will find Scientific-Atlanta's Sega Channel game adapter easy-to-use and handle. It is light-weight, portable, and easy to install.

The futuristic design will blend in well with the SEGA GENESIS unit in your subscriber's home. A red power light indicates if the adapter is properly plugged in. The easy-to-operate menu button takes your subscribers straight to the main menu.

#### **Secure System**

The adapter has tamper-resistant fasteners and a secure transport

ASIC. The system also uses digital scrambling and security algorithms to further enhance signal security.

#### **Addressability**

The Sega Channel game adapter is fully addressable and can be controlled on a local or national level. The addressable system supports service tiering, transactional download events, and parental guidance levels.

#### **FEATURES**

- Fast download time (<1 min)
- Frequency agile from 50 to 120 MHz or 300 to 600 MHz
- Fully addressable, with service tiering and transactional download capabilities
- Red power LED
- Easy to install
- Futuristic design blends well with game set design
- Advanced digital security
- Light-weight and portable



# Sega Channel Game Adapter

## Packaging

The Sega Channel game adapter comes in a sturdy package that your subscriber can keep for storage or future use. In addition to the adapter, the package also includes:

1. Instruction/Installation Guide
2. AC Power Supply
3. RF Filter

## SPECIFICATIONS

### RF Distribution Requirements

Distribution level

7 to 10 dB below video carrier level

Carrier-to-noise

22 dB (min.) in 3 MHz bandwidth

Amplitude response (flatness)

2 dB peak-to-peak over 3 MHz

Maximum interfering carrier

30 dB below data carrier level

### RF Input Specifications

Input tuning range

50 to 120 MHz (Model 9593)

300 to 600 MHz (Model 9591)

Input level /AGC range

+5 to -20 dBmV

Noise figure

10 dB (max.)

Carrier modulation

9 QPR

Carrier bandwidth

3 MHz

Number of data carriers

Up to 8

RF input connector

F-type

### Data Input Specifications

Transmitted data rate

6 Mbps per carrier

Forward error correction

BCH, correctable to  $1 \times 10^{-10}$

### Data Output Specifications

SEGA GENESIS Interface

64-contact PC card edge

## Built-in Diagnostics

The Sega game adapter has built-in diagnostic capabilities. Using a special diagnostic plug, the cable technician can access the on-screen diagnostics of the adapter. These include a Bit Error Rate monitor to evaluate data integrity. The adapter can also scan for and locate new modulator frequencies when necessary. The Sega adapter can store a total of eight carriers should a larger game service become available.

## Addressable Control

Adapter initialization

Force reset, global; force reset, addressed

Game access control

Individual permissioning of games

Pay-event control

Permissioning of pay events

Parental guidance

Permissioning of five PG levels

## Controls and Indicators

Menu switch

Top panel mounted momentary switch

Power

Top panel mounted red LED

Data transfer

On-screen download progress bar

## Security

Data scrambling

Scientific-Atlanta proprietary

Mechanical

Tamper-resistant screws

## General

Power supply

Wall-mounted DC supply

Labeling

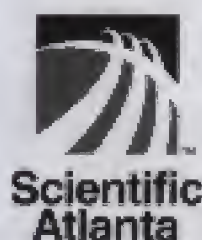
Bar-code label: revision, data code, mfg. sequence number

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